UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,187	01/20/2004	Hyung Man Park	2336-238	7706

7590 03/07/2007

LOWE HAUPTMAN GILMAN & BERNER, LLP
Suite 310
1700 Diagonal Road
Alexandria, VA 22314

EXAMINER	
WANG, KENT F	
ART UNIT	PAPER NUMBER
2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,187	PARK ET AL.	
	Examiner	Art Unit	
	Kent Wang	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *1/20/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/1/2006 and 6/21/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The references listed on the Information Disclosure Statements (IDS) submitted on February 1, 2006 and June 21, 2006 have been considered by the examiner (see attached PTO/SB/08).

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 - 3, and 6 - 11, are rejected under 35 U.S.C. 103(a) as being unpatentable over Stenzel (US Patent 5,737,032) in view of Kehtarnavaz (US 2003/0052978).

Regarding claim 1, Stenzel discloses a digital automatic white balance device comprising:

- a timing controller (50) for receiving a vertical synchronization signal and a horizontal synchronization signal of an input image inputted to the device, and producing a timing control signal (see figure 2 and col. 6, lines 12-23);

- an RGB multiplier (i.e. color space converter 36 which performs a three by three matrix multiplication with RGB gains) for multiplying input RGB image data inputted to the device by received RGB gains corresponding respectively to RGB channels (see col. 5, lines 53-57);
- and a second YCbCr averaging unit (i.e. color space converter 44 for converting and obtaining averages image data) for converting output RGB image data outputted from the RGB multiplier to YCbCr image data, and then obtaining second YCbCr averages Y2avg, Cb2avg and Cr2avg of this YCbCr image data (see col. Line 65 to col. 6, line 11).

Stenzel does not explicitly teach the elements of a first YCbCr averaging unit and an RGB gain controller.

In same field of endeavor (digital automatic white balance), Kehtarnavaz teaches a system for generating automatic white balance via illuminant scoring autoexposure comprising:

- a first YCbCr averaging unit (i.e. "color conversion") for converting input RGB image data inputted to the device to YCbCr image data, and then obtaining first YCbCr averages Y1avg, Cb1avg and Cr1avg of this YCbCr image data (see figure 2, [0035], and [0038]);
- and an RGB gain controller (i.e. "white balance") for comparing the second YCbCr averages with predetermined target YCbCr averages, respectively, according to the timing control signal from the timing controller, and obtaining RGB gains, corresponding respectively to the channels, on the basis of the first YCbCr averages, according to the

compared result, and then providing the obtained RGB gains to the RGB multiplier (see figure 2 and [0043]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Stenzel by utilizing the "color conversion" as a first YCbCr averaging unit and "white balance" as an RGB gain controller as taught by Kehtarnavaz. The motivation to do so would have benefit of using a controllable digital converter for altering the characteristics of a digitally encoded video signal with respect to gain, color, offset, threshold limits and the like, relating to both luminance/color differences and RGB encoding of the video signal (see col. 3, lines 7-13 of Stenzel).

Regarding claim 2, Kehtarnavaz clearly teaches a first RGB-to-YCbCr converter (i.e. "color conversion" in figure 2) for converting the input RGB image data to YCbCr image data (see [0004]) and figure 2), and a first YCbCr averager (i.e. "white balance" in figure 2) for obtaining first YCbCr averages of the YCbCr image data from the first RGB-to-YCbCr converter (see [0044]).

Regarding claim 3, Stenzel clearly teaches a second RGB-to-YCbCr converter (44) for converting output RGB image data to YCbCr image data (see col. 5, line 65 through col. 6, line 11), and a second YCbCr averager (e.g. filter) for obtaining second YCbCr average of the YCbCr image data from the second RGB-to-YCbCr converter (see col. 6, line 3-8).

Regarding claim 6, Kehtarnavaz teaches the method operation of RGB gain controller changes Y/Cb/Cr steps on the basis of a predetermined coarse step (e.g. computing the closeness in hue of the prototype and the reference

colors; see [0043]), and then calculates the RGB gains (e.g. product between the prototype color vector and the reference color vectors are computed; see [0043]).

Regarding claim 7, Kehtarnavaz teaches the method operation of RGB gain controller comparing the second YCbCr averages with the target YCbCr averages (e.g. compared to all the reference colors in that sector) (see [0043]), and changes the Y/Cb/Cr steps by adding or subtracting the coarse step to or from the Y/Cb/Cr steps on the basis of the compared result (computing the closeness in hue of the prototype and the reference colors) (see [0043], and then calculates the RGB gains (e.g. product between the prototype color vector and the reference color vectors are computed; see [0043]).

Regarding claim 8, Kehtarnavaz teaches the method operation of RGB gain controller calculating the RGB gains on the basis of a predetermined A/D conversion resolution, the changed Y/Cb/Cr steps, the first YCbCr averages, and the target YCbCr averages (e.g. the primary color gains are adjusted based on the average of the gains associated with the neutral colors of the Macbeth reference colors; see [0044]).

Regarding claims 9, 10, and 11, these claims differ from claims 6, 7, and 8 only in that claims 9-11 are the method operation within fine range where claim 6-8 are within coarse range. Thus they are analyzed as previously discussed with reject to claim 6-8 above.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stenzel in view of Kehtarnavaz as applied to claim 1, and further in view of Meyers (US Patent 6,486,889).

Regarding claim 4, note the discussion of Stenzel and Kehtarnavaz above. Stenzel and Kehtarnavaz do not teach the step of selecting RGB gain is whether enable or disable. However, Meyers teaches the different operations of the RGB gain controller are selected depending on whether "RGB gain enable or disable" is set (see col. 2 lines 51-65). It would have been obvious to one of ordinary skill in the art at the time this invention was made to have used a mode control register for selecting the RGB gain as taught by Meyers to the white balance device of Stenzel as modified by Kehtarnavaz so that if the RGB gain enable is set, the RGB gain controller recalculates and provides RGB gains, and if the RGB gain disable is set, the RGB gain controller provides predetermined basic RGB gains, thus increase the flexibility of image information communication and improve the quality of white balance (see col. 1, lines 25-42).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stenzel in view of Kehtarnavaz as applied to claim 1, and further in view of Higgins (US Patent 7,176,935).

Regarding claim 15, note the discussion of Stenzel and Kehtarnavaz above. Stenzel and Kehtarnavaz do not teach the RGB gain controller has preset coarse, fine and lock ranges. However, Higgins teaches the RGB gain controller has preset coarse, fine and lock ranges (see col. 5, lines 41-47).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the gamut expansion unit (108) as preset application as taught by Higgins to the white balance device of Stenzel as modified by Kehtarnavaz because it provides the RGB gain controller to recalculate RGB gains that may be used to scale both the chroma components with multipliers (see col. 5, lines 18-47).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Cheng (US 7,162,078) is cited to teach an automatic white balance method for capturing a color image first and performing gray point searching in RGB color space or YUV color space.
- Matsumoto (US 6,271,827) is cited to teach a display system for determining and converting the display data format into a predetermined format.
- Murakami et al. (US 4,736,241) is cited to teach a white balance adjusting device for detecting a change of color temperature for an illuminating light source.

Inquiries

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kent Wang whose telephone number is 571-270-1703. The examiner can normally be reached on 7:30 A.M. - 5:00

PM (every other Friday off). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-270-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kent Wang
5 March 2007

CHANH D. NGUYEN
SUPERVISORY PATENT EXAMINER